AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

Circulating Wherever Dyestuffs are Used

Vol. I | New York, January 7th, 1918 | No. 14

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To What Extent May Dyes Be Standardized?

Before the war a standard for any particular dye represented an arbitrary quality which had been adopted by its manufacturer. It was the custom for each of the large factories to send to their competitors (even when they were really competitors) at least a kilogram of the new dye with descriptive matter relating to constitution and working qualities. In this way infringements were avoided, and if another factory obtained a license to manufacture the color it was customary to put out a type that corresponded as closely as possible with the original.

In the case of dyes that form true crystals we have reason to believe that the types should represent 100% dyestuff, because one of the fundamental rules of organic chemistry is that the formation of perfect crystals is dependent on the purity of the compound. Nevertheless there are many ways of making commercial crystal dyes that fall far below 100% but the possibility of obtaining a strictly pure crystal makes the standardization of such products a relatively easy matter.

That the original standards were purely arbitrary is best seen in such dyes as Rhodamine B which was sold for many years as a type before the consumer knew that it was possible to obtain it five times stronger. Chrysophenine and Sky Blue FF both appeared as triple strength shortly before the war and Chinoline Yellow was offered which was five times the strength of the Badische type.

The advantage to the manufacturer was naturally in the sale of concentrated products as the reduction in expenses due to the handling of less bulk could hardly be overlooked, but if the importation into this country of concentrated dyes, and their reduction to type before sale, was the means of avoiding the payment of full duty it puts the matter in another light.

The consumer is somewhat to blame. Even today a cheap much-reduced dye will be bought more eagerly than a better money-value in a high priced concentrated color. The consumer ought to know that if he saves the cost of reducing, the handling and packing of a larger lot and the lower transportation charges by the use of a strong dye he is sure to have these extra charges added when he buys a weak product. There was a reason why it paid to import strong dyes and sell weak ones when they came from foreign countries, but now the colors made in America are more profitable to maker and consumer if they are sold at the highest possible concentration. The consumer has only to test and compare prices and not be misled by low prices as the highest priced goods are generally the best value per unit of strength. Coal is bought on a basis of Therman units, Caustic Soda on its per cent of purity and every supply that can be tested is given a valuation, but dyes are often judged by a sort of rule of thumb even though they are the most expensive commodities purchased by the mills.

The American dye manufacturer is in no way bound to adhere to the types or standards of strength that were in use before the war. We can be radical and

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adopt an entirely new system if we wish to do so. It would be unjust to the smaller manufacturers if we took for each color a standard of theoretical purity based on the pure chemical compound representing that color.

We might learn something from the medical profession and model our system on the U. S. Pharmacopoea. A dye then would be defined as being a certain chemical compound, the chief ingredient would have to be present in a percentage that would be determined from observation of dyes that are now practical commercial products, certain impurities must be absent and certain others may be present within defined limits. The color produced when dyed under certain rigid conditions must correspond to an arbitrary standard. The standard of color could be selected from the products of different manufacturers and whether a sample that is off-shade could be shaded by another color, to match the standard, or whether it would get a lower rating would have to be decided by the proper authorities. The consumer does not realize that the output of the most efficient dye factory is never absolutely uniform and that considerable allowance must be made, by not demanding too rigid a standard, so that extra strong lots may be reduced and slight off-shades corrected, without it being considered as adulteration.

The actual color content of most of the basic dyes can be determined accurately by titration methods. Other classes of colors having solubility in alcohol, etc. can be separated, but quite a number especially direct cotton dyes, sulphur and vat colors will need some special methods invented for their analysis. There is a method of exact identification, by means of the spectroscope and Formanek's tables, but the presence of shading colors and by-products from impurities in commercial dyes makes this method one of scientific rather than practical utility. Perhaps a further explanation of such a statement is necessary—we mean that, any method adopted should be capable of use by the average dye tester and not be made so complicated that none but an experienced chemist could expect to get accurate results.

The adoption of practical dye standards would involve a repository and custodian of standards from which smaller lots could be supplied for individual use, an arrangement which could be made self-supporting.

There is yet another phase of dye testing and sampling which has not been taken into account—moisture content. Some dyes like Fast Acid Violet 10B, Geigy's Erioglancine, Acid Greens, Methyl Violet 2B, etc. are quite hygroscopic or deliquescent and even dissolve in the moisture they absorb from moist air. Others do not give such visible evidence but simply cake together and still others retain their powder form without change. If a standard had been packed in a tight receptacle before it had absorbed much moisture from the air and a small portion of the same lot had been more freely exposed there could easily exist a difference of five per cent or more in the moisture content. Five per cent of moisture would reduce a dye just as efficiently as five per cent of salt and in a case of controversy this should always be remembered. A standard of a dye must be defined among other features, as being correct only at e. g. 65% humidity and 75° F. (these being the Bureau of Standards figures for normal humidity and temperature). Tests against standard would also be correct if exposed freely to the air, with the standard, about one hour before weighing.

The average commercial dye will vary within five per cent in strength in different parts of the same package. The average eye cannot detect a difference of less than five per cent in two dyeings on textile fabrics. From this it is evident that due allowance must be made for such conditions and that the introduction of absolute requirements might lead to endless controversies.

There seems to be no reason why an American standardization cannot be effected. Its utility will depend entirely on the co-operation of the manufacturers and their voluntary consent to be bound by the restrictions thus placed on them.

When the consumer fully appreciates the system it will overcome many of the difficulties in selling a new factory product and will automatically correct many of the undesirable features that existed before the war.

Dyestuffs Continue Quiet

In a recent interview with one of authority in the dyestuff industry, we were informed that this week has seen a lull in the market, which is due perhaps to conflicting reports from Washington.

The manufacturers are awaiting more definite information regarding the bills now up for discussion. If the proposed standardization of fabrics and colors is accepted, it will have a decided effect upon the industry as a whole.

The manufacturers are looking forward with much interest to the coming meeting of American Dyestuff Manufacturers, to be held in New York City on January the twenty-second and twenty-third.

It is felt that the manufacturers, by concentration, can demand certain things from the Government which are now unattainable.

Little activity is expected until after the meeting, for reasons that are obvious to all.

A meeting of those interested in the proper conduct of the Reporter will be held in the offices of the Black Publishing Company, Four Seventy Fourth Avenue, New York City, on Tuesday evening, the eighth of January.

Plans will be made by which we will be enabled to place before our readers articles that are carefully censored.

"This is rather an unusual procedure for a trade paper, but in this industry we feel that it is necessary."

New Use for Turkey Red Oil

A new use has been found by the paper trade for sulphonated castor or red oil. This product, as is well known, is used extensively in cotton finishing and dyeing.

After some experimenting, it has been found that a small quantity of an alcoholic solution of this oil will prevent the usual formation of foam in the beaters.

Notes of the Trade

The Lansing Chemical Company, of Lansing, Michigan, has increased its capital from $100,000 to $200,000.

The Shermville Chemical Works has been incorporated at Chicago, Ill., with a capital of $2,500.

The exports of logwood from Jamaica to this country from July to September, inclusive, 1917, were valued at $114,899 as compared with similar exports for the same period of 1916, valued at $496,120.

Stockholders of the Grasseli Chemical Co., New York, will hold a special meeting Jan. 24 to vote on a proposed increase of the authorized capital stock from $20,000,000 to $50,000,000. The proposal includes an increase of $10,000,000 in the preferred stock to $15,000,000, and an increase of $20,000,000 in the common stock to $35,000,000.

The Empire Piece Dyeing and Finishing Co., of Paterson, N. J., has filed an amendment to its charter, increasing the capital from $25,000 to $50,000.

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Works: Waverly N. J. Chicago, Heights, Ill.
Distributors for Essex Aniline Works Reliance Aniline Chemical Co.
Offices: Chicago Boston Paterson Greensboro

The Brooklyn Chemical Works has been incorporated with a capital of $30,000, by J. P. Buzzio, A. Farrey and B. Isaacs.

A society for the furtherance of chemical knowledge and current scientific data has been organized by the technical chemists and chemical engineers of Tacoma, Wash. The president is Paul Van Horst and the secretary is B. H. Bennetts.

The L. & S. Silk Co., 159 Ward street, Paterson, N. J., has been incorporated, the capital stock being $20,000. The incorporators are Hyman and Mary Lefkowitz and Charles Schwartz. This company will take over the Lefkowitz Silk Co. of Paterson.

J. A. Migel, New York, manufacturer of silks and other textile fabrics, has taken out incorporation papers, the capital stock being placed at $1,000,000. The main plant of the company is located at 711 Sip street, West Hoboken, N. J.

M. Ascher Silk Corp., of New York, has been incorporated to manufacture silks, textiles, etc. The capital stock is $262,500. Moses Ascher, J. Yale Wilkins and Harry C. Durando, all of New York, are named as the incorporators.

The Artcraft Lorraine Silk Manufacturing Co., Inc., New York City, capitalibed at $7,500, has been incorporated. The manufacture of textiles will be carried on by this company, the incorporators being H. J. Cohen of New York, Harry L. Krackman and Isidore Margolis, Paterson, N. J.

The Henry Myer Thread Manufacturing Co., 400-406 South Market street, Chicago, Ill., advises that it is installing an additional winding and coning plant at 400-404 South Market street. The company manufactures window coning and spooling yarns and makes a specialty of mercerized thread, "Subsilk" brand.

In the future the local plant of Joseph Bancroft & Sons Co., Wilmington, Del., will bleach, dye and finish cotton piece goods only, the manufacture of cotton cloth for hollands and book-cloth having been transferred to the Reading, Pa., branch of the company.

The Lyon Carpet Co., Lowell, Mass., which has of late been operating a large part of its spinning machinery upon worsted knitting yarns in khaki and olive drab shades, is erecting an addition to its dye house and enlarging one end of its drying room, 14 x 66 feet. The roof of the building is now irregular, but it is to removed and will be replaced by a new once of equal height all around.

The Chemical Market

Conditions in this industry were quiet during the week and this can, no doubt, be attributed to the influence of the holidays.

The chemical manufacturers report some activity, but among the dealers there is a desire to sell, and sell quickly, because they find themselves stocked with a varied lot, with few buyers in sight.

Chemical manufacturers as well as dye manufacturers are awaiting reports from Washington before they proceed with plans for the new year.

The immediate outlook is not particularly bright and the unrest among the manufacturers is felt in the market.

Reports regarding the commandeering of chemicals has caused further perplexity and the shortage of several products demanded for federal use has caused a decided lull.

There is a heavy demand for sulphuric acid, but beyond this there is very little activity.

Vat Dye Manufacture

The following is an interview given the press by Mr. I. F. Stone of the Natural Aniline & Chemical Company, Inc., in which he outlined the possibilities in the vat dye industry. Considerable interest is centered on this subject regarding which Mr. Stone says:

"Vat dyes are by all odds the most important covered by German patents in this country. There are comparatively few aniline dyes patented here which

are not already made in American plants. American manufacturers have not been able to make any progress in turning out vat dyes, however, and the German patents which will shortly be available through the issuance of lincenses will be of tremendous advantage in building up a well rounded out dye industry.

"The National Aniline and Chemical Company was among the first to put in an application for the use of German patents, most of the licenses asked for concerning vat dyes. No word has been received as to whether the licenses would be granted, but we expect action shortly.

"I understand that the Government's attitude toward the dye industry in very favorable and do not believe that any difficulty will be experienced in obtaining the licenses. I have no information as to the terms for which the licenses will be granted, but expect that they will be for the duration of the patent, the German owners to be compensated as the Government sees fit. To operate under the patents will require the expenditure of considerable capital and effort, and it would not pay American manufacturers to enter into the production of the articles patented merely temporarily. They must have some assurance of protection for the future.

"The basis of vat dyes is a coal tar derivative that is in plentiful supply here, but a new plant and equipment will be required for their manufacture. The construction of the plant would take some time, so that vat dyes could hardly be placed on the market for several months.

Exclusive License

"I do not think that the Government will discriminate in favor of any particular interests in the case of the dyestuffs industry and I doubt that the granting of exclusive licenses would be desirable. There is a broad enough field for all competitors. Particularly is this true of the vat dyes, for which there will unquestionably be a wide market. The number of applications to operate under these patents will be limited, principally because the development of the processes will involve a comparatively large investment.

"Synthetic indigo, which is generally classed with the vat dyes and, before the war, was manufactured exclusively in Germany, is already being produced here in commercial quantities, although not in amounts nearly sufficient to meet the demand. Synthetic indigo will be placed on the market next year, manufactured by an American process, and the du Pont interests have also developed a process independent of the German patent which will be employed to put American indigo on the market. The Dow Chemical Co., a western company located in Michigan, already is manufacturing synthetic indigo here.

"Our costs figure out approximately the same as the German costs. The final test will, of course, come only when we are turning out indigo on a commercial scale. But the indigo situation appears already to be fairly well in hand, and it is unlikely that the German patent will be employed as extensively as those on the general list of vat dyes.

"The addition of vat dyes to the line of colors made in America will insure a complete dye industry here. Aniline colors are now manufactured in the United States as good, if not better, in quality as those imported from Germany before the war, and the range of colors and shades is generally regarded as satisfactory. Production has reached a point where American requirements can be handled without much difficulty, and in certain lines a state of overproduction exists.

"Through the use of German patents Great Britain has established since 1914 a successful vat dye industry, producing colors that fully come up to standard. Recent reports show that it will be a matter of only a short time before British manufacturers will be able to produce vat dyes in sufficient amount to meet all the requirements of their market.

Government is in Need of Wood Alcohol and Bleaching Powder

The U. S. Signal Corps is in need of large supplies of wood alcohol and bleaching powder, but no intimation is given of their use. Belief is expressed that a price will be fixed through the War Industries Board sufficiently attractive to producers to eliminate any need of commandeering a sufficient supply for Government needs.

INQUIRY DEPARTMENT

In the establishment of this department it is our desire to help the consumer in buying his products direct from the manufacturer or reliable dealer. Accordingly all questions relative to source of supply will be answered to the best of our ability in an impartial way.

Furthermore, we propose to help in any difficulties that consumers may be having with dyes and chemical products providing that questions do not involve simply tests, which can be readily obtained from those who specialize in such work.

We hope that the consumer will not hesitate in making use of the department, for all questions relative to processes, etc., will receive the personal attention of a chemist who is fully qualified to handle the subject.

Coloring Varnishes

Question—What aniline dyes can be used to color varnishes without interfering with their drying properties?

Answer—Everything depends on the composition of the varnish. If a varnish contains turpentine, linseed or Chinese wood oil or other material having drying properties i. e. capable of absorbing oxygen from the air it will exert a reducing action on most coloring matters. Under the influence of this reducing action most aniline products are decolorized and the varnish will not dry until they are entirely destroyed. The most susceptible to this influence are the stearates and oleates of the basic dyes and nigrosine base. The azo oil yellows, reds and oranges do not lose their color but retard the drying until the color is faded by sunlight. Lacquers made with Amyl Acetate or Fusel oil can be used when freshly made and the color will return as the solvent evaporates but if kept for several days the color is destroyed permanently. The only really successful colored varnishes are those which do not depend on oxidation for their drying qualities but which are simple solutions of gums or resins in alcohol or other indifferent solvent. Such varnishes may be colored with spirit soluble basic dyes, but as these are also soluble in water it is better to use such of the oil colors as are soluble in alcohol. Stearates and oleates are to be avoided as they soften the gums and interfere with the formation of a good varnish film. Resinates and Carbolates are practical but are not much in evidence at present.

Basic dyes exactly precipitated with acid dyes give products soluble in alcohol, but not in water, and are very useful for this class of work.

Tannin Mordants

Question—What is the effect in using too much and too little tannin mordant for basic dyestuffs on cotton?

Answer—We presume in both cases that sufficient Antimony has been used to properly fix the mordant. When too much tannin is present there is a lack of penetration and the outside parts of the skeins are full of bronzy patches while the interior is often pale and even undyed. An excess of Acetic Acid would give a more even dyeing but the tendency to crock or rub off would be quite pronounced. When too little tannin is used a thin, bright and even shade may result but the bath will not exhaust and if the rinsing is not thorough the strongly colored liquid will accumulate at the end of the skeins and cause bronzy stains. In the first case the bronziness caused by too much tannin will not wash off readily but when due to the later cause will wash out quite readily.

How Chrome Green is Made

From an interesting booklet on the Paint and Varnish Making Industry in Philadelphia, prepared by Ernest T. Trigg for the Philadelphia Chamber of Commerce, we quote the following brief popular statement on chemical dry colors:

Chrome green is probably the most widely known among the group of commercial pigments known as dry colors. It is composed of two basic colors, namely, blue and yellow. The combination of these colors which produces green is largely mechanical. It is the blending together of these colors to produce a number of shades of green. These shades run from the palest yallow-toned to the deepest blue-toned greens.

The union of the two colors can be accomplished in a mechanical way by mixing the two colors in the dry state, but it is more scientifically done by what is known as the "wet process." Here we have a combination of the two colors,

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AMERICAN DYESTUFF REPORTER
Published weekly by
BLACK PUBLISHING CO.,
470 Fourth Ave., New York

DEXTER W. HEWITT, President
A. P. HOWES, Vice President
ELISHA HEWITT, Secretary and Treasurer

MYRON DREW REESER, Managing Editor
Domestic Subscription, $3 per year. Foreign, $4
Advertising rates on request.

Educating the Merchant

The coal-tar industry—from a standpoint of production—is assuredly well established in this country. The lamentable fact is that the consumer in the textile field does not know what has actually been accomplished.

We were in conversation a few days ago with a manufacturer who is placing on the market a blue-black dye which is in great demand by the hosiery trade. We examined a dyeing of this black and were informed by the manufacturer that one of the old-line houses had pronounced it a better quality black than was ever obtainable before the war. This is only one instance of the wonderful strides which have been made by American manufacturers in this new industry. We have seen the colors in the process of manufacture and have examined the dyeings of same and can say that the quality and range of colors is indeed surprising.

THE MANUFACTURER MUST BE LESS SECRETIVE.

The manufacturer is now realizing that he must give the consumer more information regarding his efforts and successes and not limit himself to informing the broker only. Hitherto the information was attained through some unreliable brokers who contorted and garbled, to suit themselves, regardless of truth. Let us hope that the unreliable broker has passed out of existence, and that now the information will be given readily by the manufacturer and that by this information regarding the quality of his products, the man behind the counter, knowing existing conditions as they really are, may learn to do his share. Instead of insuring the customer that the dyes are not good, let us go back through the process of manufacture and we will find that the trouble is due to the dyes having been purchased from a broker and not received in the same condition as when they left the plant of the manufacturer. The broker in some instances does not care as he has little to lose and his protection is, "you bought from sample and test of the dye, so what can I do?" He assures the customer that he knows little or nothing about testing colors and by acknowledging his limitations, leaves a loop-hole of escape in the event of a discovery of an addition of foreign matter in the original shipment from the manufacturer.

If propaganda of a misleading nature is to be directed by foreign countries against the American Dyestuff Industry, there would be no one more susceptible to influence than the merchant.

His education is of vital importance and should certainly not be neglected.

EDITOR.

If the department heads of the large textile houses and retail stores were to inspect the equipment of the plants, in and near this city, their opinion of American-made dyestuffs would be strengthened.

The department store manager is not wholly to blame for his hesitancy in recommending American-made dyestuffs. A great many manufacturers have desired to withhold information—for some unaccountable reason—and the result is indeed detrimental to the future of the industry.

A manufacturer who is building his business upon a hard-earned reputation, must hesitate before placing upon the market a dye of inferior quality and strength. He knows that each complaint from a customer will eventually come to him and that his mistakes will materially hinder his success and the success of the whole industry.

The man in the store must realize that a color made in this country must be equal to the German because the basic,

or crude materials which enter into its manufacture, are identically the same as those used by German manufacturers. It must be understood that we mean the products of reliable American manufacturers, who have a reputation to maintain and not those who only match certain colors and shades from the products of a number of different manufacturers.

A manufacturer succeeds in perfecting a certain color and then because of the demand, in most instances from second hands, he practices secretiveness, is content to sell his output and rest on his oars, without a thought of the future.

The demand for American-made dyestuffs is tremendous and because of his many most necessary points are neglected. This steady consumption will not continue and what then will be the result when competition does come? Will the consumer be educated to a point where he will continue to use dyestuffs of American manufacture? Will the boss-dyer be influenced by foreign manufacturers who will again try to monopolize this industry?

Will it be a matter of fair competition, or will certain interests exert their influence with the dye department to such an extent that their products only will meet the requirements? When the cyclonic wave of competition does come, what will happen to the small manufacturer who has built his business upon the foundation of present-day demand?

Is he in a position as an individual to make an appeal to the Government for necessary protection? Even the Government does not know what is actually transpiring with regards to the small manufacturer and what he is accomplishing. We know of a manufacturer who is placing a certain color on the market (Fuchsine) and he is so secretive about his actions that he moved his apparatus in piece by piece, and at night.

It is the actions of these men that hinder progress and awaken a feeling of suspicion in the minds of the consumer. The one factor upon which the industry is dependent is coöperation of chemists, manufacturer, consumer and Government.

The British Coal-Tar Industry and Its Difficulties in Times of War

(*Continued from last issue*)

The future of the British coal-tar color industry is a fascinating subject, about which every man may speculate, but of which no man may speak with certitude. True to our national character, the scientific pessimists are enjoying themselves preaching national disaster unless their own particular nostrums are adopted. I am unmoved by these predictions. I am old enough to remember the British push-cycle trade being told that the American push-cycle would sweep them out of the market; where is the American push-cycle in Great Britain to-day? The same jeremiads were sung about the British motor trade as compared with the French: does not the British motor to-day stand unsurpassed? Of more recent date, the British aeroplane has been denounced as inefficient, but which aeroplane flies over its enemy's lines the more—the British or the German? Therefore I am unmoved by the prophets of gloom concerning the coal-tar trade color. At the outbreak of war predictions of dire disaster

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were prophesied to the textile trade, owing to the shutting off of German colors. Those predictions have been completely falsified, because what do we actually find? We find the shares of the leading color-consuming companies in this country actually standing at much higher figures than they were before the war; textile shares are one of the features of the Stock Exchanges. I maintain that the British firms can claim a share in that very satisfactory state of affairs, owing to the way in which they have expanded their supplies. The British firms had not only the future for which to provide, but they had also the immediate shortage with which to deal. Naturally steps had to be taken which would not in normal times have been tolerated, but the successful way in which they dealt with that shortage is reflected in the equipment of the British army, and in the fact that the dyeing trade, instead of sinking in disaster, has never been so prosperous.

The war has opened the eyes of the world to the value of the chemist, who now bids fair to be granted that status which should always have been his. The future is with the trained chemist. Research is now being organized on a scale which has never before been attempted in Great Britain, and British Dyes, Ltd., are happy to know that the director of their research department, in the person of Professor W. H. Perkin, possesses a name of the happiest augury in the coal-tar color industry.

When I think of the army of research chemists employed in the past by the German firms, I am amazed, not at the results which they have produced, but I am amazed that the results were not much greater. The German firms employed mass tactics with their chemists, just as their General Staff employ mass tactics with their soldiers. Why should not the British chemist do quite as well as the German chemist? He is at last being given a chance to fight on equal terms. The future will show the outcome of that fight. Speaking for my colleagues, we enter the fight with full knowledge of its severity, but with great keenness and every confidence.

Cannot the pessimists draw some cheer from the success of the national efforts in the manufacture of high explosives? We never pretended to be a nation skilled in industrial organic chemistry, but look at the splendid results produced in a short time by British chemists in the matter of high explosives under the organizing genius and enthusiasm of Lord Moulton.

If the British consumers are honest in their desire not to buy German dyes again, there are already many dyes on the list which they need never buy from Germany again, and this list will grow rapidly in the near future. The future of the British coal-tar color industry depends as much on the good-will of the consumer as on the industry itself. Let sympathy and patience be extended to the industry during these early days of expansion—the task in front of the industry is sufficiently heavy to warrant it.—*Jour. Royal Soc. Arts*, Dec. 8th, 1916.

The Warner Chemical Co., Carteret, N. J., has filed notice of an increase in its capital from $750,000 to $1,000,000 for expansion.

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How Chrome Green is Made

(*Continued from page 7*)

chrome yellow (lead chromate), and Prussian blue (ferric-ferrocyanide) compounds obtained from the metals chromium, lead, iron, potassium or sodium. Chrome yellow, as made from metallic lead, is a lemon shade with a greenish tone. It enters into perfect harmany with the iron blue to produce greens, which can be manipulated to produce any shade of green desired.

The principal use of chrome green is in the manufacture of paints of various kinds, and it is very popular for such use because of its pleasing contrasts and because it is, when properly reinforced, very durable and fast to light. It is also largely employed in the manufacture of oil cloths, linoleums and printing inks.

A detailed explanation of how a chrome green is made involves a detailed explanation of how both a chrome yellow and a Prussian blue are made. The following is the process of manufacturing a medium shade chrome green:

Making the Yellow

Two hundred and twenty-five pounds of litharge are dissolved in 215 pounds of acetic acid, with enough water to form a clear solution. The solution is made in a large wooden tub or tank under either hand or power agitation. Simultaneously, in a separate wooden tub or tank, 150 pounds of bichromate of potassium are dissolved in water by similar agitation, and then, when both solutions are ready, they are brought together in a separate and larger wooden tub or tank known as the striking tank, which for convenience is set just below the dissolving tanks. When the two solutions come together a chemical reaction takes place —the combining of the lead acetate (lead solution) and bichromate solution forms a chemical compound which gradually precipitates to the bottom of the striking tank and which is the desired lead chromate or chrome yellow. If it were to be finished as a chrome yellow it would then be washed by decantation until free from acid or soluble salts, filtered, dried and powdered as we later wash, filter, dry and powder the green. However, as it is to be used for making a green, the washing is deferred at this stage and the blue is introduced immediately.

Making the Blue

Sixty-five pounds of prussiate of potash are dissolved in water in one wooden tub or tank and 65 pounds of sulphate of iron (copperas) are dissolved in water in another wooden tub or tank. These two solutions are brought together in a larger striking tank in precisely the same manner as described for the yellow. The chemical product which forms as a precipitate is ferricferro cyanide. It appears as a whitish precipitate, and is, in the striking tank, oxidized with a combination of 50 pounds of sulphuric acid and 5 pounds of chloride of lime, separately dissolved in water or stirred in mechanically. When thus oxidized the precipitate is a very dark shade of blue. In the striking tank the blue is washed up with fresh water by repeated decantation until it is free from acid or soluble salts and tests neutral—(neither acid nor alkaline). At this stage it is liquid blue, such as is used in combination with the yellow to make greens. If it were to be finished as a Prussian blue it would be filtered, dried and powdered.

Making the Green

The liquid blue is next added to the yellow in the yellow striking tank (properly the green striking tank) under constant agitation, and the combination produces the medium shade of green desired. As soon as the chrome green has been formed it is allowed to precipitate, and it is then washtd up with fresh water by decantation until it is free from acid or soluble salts. It is then pulp green. The next step is to remove as much of the water as possible mechanically. This is done with a filter press. The press consists of a number of cells or chambers into which the pulp color is pumped or forced by air pressure. Each cell or chamber collects the pigment between filter cloths, while a large part of the water is forced through the cloths and runs out of a special drain attached to the bottom of each cell or chamber. The next step is to take the cells or chambers apart and remove the pasty cakes from the frames which form the cells

or chambers. This is done by laying them flat on a tray and running a wide blade or knife around the edges. The cake drops out on the tray and the trays are then loaded on a portable truck to be dried.

The drying is done by wheeling the trucks holding the trays with the color cakes into a kiln or stove, which is steam heated and which is provided with a forced draft to circulate the heat thoroughly and to drive off, through suitable vents, the moisture as it evaporates from the cakes. Such a green as we have made will require drying for 36 hours at a temperature of 140 degrees Fahr. At the end of that time the kiln or stove is opened and the thoroughly dry cakes of color are removed and ground up impalpably fine in specially designed mills. The color is then either packed in barrels and other packages or stored in bins for use.—*Oil Paint & Drug Review.*

Colored Silk Effects On Cloth

Silk effects have been produced in printing by means of finely-powdered metal, suspended in a binding medium.

With all its advantages, this method has two drawbacks, which must be considered, the first being that among the metallic powders available for such purposes there is not a single one which is actually white; that chiefly employed for the purpose (aluminium powder) is always greyish blue. The consequence of this is that in using the metallic powder processes it is not possible to produce a pure white on light substances. It is only on dark substances that, by contrast, the effects printed with metallic powders appear white.

The second drawback is the impossibility of printing any particularly desired tints with metallic powder, the printing being restricted to such shades of color as are found in the aniline colors. The metallic powders colored with coal-tar colors, moreover, owing to the colors lying only on the surface, have the disadvantage that when rubbed, the color is removed and the metal beneath exposed.

The coloring of the binding medium is not practicable, as in the first place the binding media, which can be used for metallic powders, are not easily colored; and in the second place, the metallic powders suspended in the medium, which is colored with great difficulty, alter the color, and in certain circumstances entirely nullify the effect. Thus, the coloring of the binding medium results either in the production of improperly colored or entirely colorless objects.

To overcome this trouble is the gist of a process invented by an Austrian chemist. By its employment it is possible to obtain pure white silk-like glassy effects in any color, at the option of the colorist.

Cellulose and Mica

The method is based on the principle of mutual action of cellulose and cellulose derivatives and finely-powdered mica. The employment of mica adhesively attached to woven materials is well known, but the highly effective and in every respect genuine result produced by the combined action of mica and cellulose derivatives is the gist of the new process. If an impression be made on a ground with a solution of cellulose, nitro-

Ponceau Scarlet (Biebirch)
Fast Acid Yellow
Fur Black (Para Phenylene Diamine)
Napthol Green
Bismark Brown
Alizarine Blue Black
Meta Toluylene Diamine
Chrome Red
Amino-Azo-Benzene
Alizarine Yellow G

Chrysoidine

Manufactured by

Dye Products & Chemical Company
(INCORPORATED)

Works: Newark, N. J. **200 FIFTH AVENUE, NEW YORK**

cellulose, viscose, or acetate of cellulose, in no instance is a silk effect produced either with or without subsequent calendering. The ground shows through the transparent impression and prevents the desired effect.

By the addition of a substance producing non-transparency, for example, a powdered white coloring body, no better result is obtained. The lustreless white powder which does not reflect the light, destroys the lustre of the cellulose or of its derivatives, and the result is that impressions are produced in no way differing from those obtained by using the white coloring body in combination with another binding medium.

On the other hand, it can be easily shown that finely powdered mica in ordinary media does not produce silk-like glossy effects. Neither gelatine nor albumen, the carbohydrates still employed as binding media solutions of resin or any kinds of varnish, when mixed with mica, produce satisfactory, glossy, silk-like effects, as these binding media more or less completely obscure the lustre of the mica. Only by the employment of mica in combination with cellulose, nitrocellulose, viscose, and other derivatives of cellulose, are silk-like glossy effects produced. It is expressly pointed out by the inventor that cellulose and its derivatives do not act exclusively as binding or fixing media for the finely powdered mica; the mica could be equally well fixed, or in certain instances even better, with other fixing media—for example, gelatine, albumen, varnish, and solutions of resin. What is actually under consideration here is the combined action of the mica with the cellulose derivatives, which are known to possess a lustre-like silk.

As the solutions of cellulose derivatives can easily be colored without injuriously affecting their lustre and that of the mica when the drying is effected, and without having their tints undesirably affected by the mica, it is possible to produce colored, silk-like lustrous printing effects, the tints of which are entirely at the option of the colorist. The importance of this procedure for the colorist, who is at present confined to the tints given by metallic powder, and in the production of thoroughly soft tones which are not obtained at all when metallic powders are used, as well as for printing effects with varying tones, will be readily seen.

The Process

The process consists in dissolving the cellulose or its derivatives in a solvent, and mixing it, colored or non-colored, with finely powdered mica, and printing the particular ground with the resulting paste. The printed material is dried in a drying chamber or on heated rollers.

In order to increase or improve the effect, the moistened or dried impressed material may be pressed or subjected to the right or left side action of a friction or silk-finishing calendar.

When viscose is employed, there is the further action by which it is rendered insoluble by steaming. In order that impressionable solutions of celluloid nitrates (pyroxylines) may be obtained on the roller machine, it is desirable not to employ solvents with a very low boiling point.

As an example, the following proportions give good results: 100 parts by weight of a 15 per cent solution of nitrocellulose (nitrate of cellulose, pyroxyline, collodion cotton, etc.) in a suitable solvent (for example, amylacetate, butylacetate, etc.) to which a small quantity of a softening medium, such as castor oil or glycerine, may be added, are thoroughly mixed with 8 to 10 parts in weight of finely powdered mica. The particular ground is then covered by hand or machine with the paste and dried.

The printed material may be finally finished off by ordinary or silk-finishing calenders, or by pressing.

—*Dyer & Calico Printer.*

Dyestuff Adulteration

Receipt is acknowledged of your letter of January 6. In reply would say that we are of the opinion that there is need for such a magazine as you publish.

It is our opinion that there has been considerable adulteration in this industry in the past two years, and we know it has put the paper manufacturers on their guard in dealing through brokers and commission men, and we believe that a discussion of this phrase of the industry would be very interesting.

"From a Business Man to His Son"

THE SALINE TINTS CORPORATION

SOMEWHERE IN
LOWER MANHATTAN.
Jan. 1, 1918.

My Dear Bennie:

So you say you will be out of Sing Sing in another month and want to join me in the dye business instead of following your regular strong arm work. My boy don't do it! Stick to your old business for it is at least respectable, although there may not be so much easy money walking on the dark streets as there was before the war and as there is in this line; but consider the family! I am getting old and cannot go about much, I cannot very well follow my old line of blackmail but my experience has been a fine thing in this game.

It looks now as if this jig was about played out, there is too much good stuff, made in this country, getting out and too little left of the old lots to keep all of us busy. Then the easy marks are getting wise to everything so that now they won't pay up until they have the stuff tested and you know how much chance we used to have when a rube wanted to take his gold brick to a jeweler before he loosened up.

Last week one of them gave me a new idea. He said he would rather have me raise his check ten percent than to take it out of the goods, providing it was all the same to me. He was trying to be funny, but honest, it's easier and safer now to run the check up a few figures than it is to dope the goods.

The straight guys, that sell American stuff, are getting together and I see my finish. They call us "gyps" but you know, Bennie, we never sold lame horses and stole them back next night. I admit that since I have been dye broking I've had to pull off some pretty raw deals, worse stuff than you ever had to when you held up some young plute in a dark hallway or when I was doing my best blackmail work, but now there is getting to be too much risk and I always did hate publicity and if I have to come up to your present hotel I think the inactivity would kill me.

By the time you are out Bennie, I will have this company sold out and we will go back to the old lay and let your dear old dad die respected.

If you know any good young fellows up there who are coming out and you think they would make good salesmen I might use them for a month or so.

With best wishes for an early meeting, as ever,

Your
DAD.

Progress in Dye Manufacture

By Louis Lazard.

Judge of the Brussels Court of Commerce and Vice-President of the Chemical Section of the Brussels Chamber of Commerce.

A few years ago a very few people outside of the sellers and users of dyestuffs knew what aniline dyes were, but since 1914 there have been so many fairy tales about them that the public seems to be interested in the evolution which has taken place in this trade.

The people have learned that the Germans were practically in control of this business, for, roughly speaking, they were supplying 80 to 85 per cent. of the

world's consumption. Their goods were known in even the smallest manufacturing centers. They had been remarkably successful, due in part to the fact that they agreed to allow long credit to their customers and to comply with their requests concerning packing, labeling, etc.

France and England, where the first attempt to manufacture aniline colors was made, and which revolutionized the dyeing process, did not follow sufficiently close the recent discovery. As a result, they let the initiative pass nearly altogether into the hands of the Teutons, who made a careful study of the new science, working out fresh processes, improving machinery and formulas for getting the requested shades and fastness for the various materials to be handled. It came to a point where competition with Germany was practically impossible, on account of all sinking funds having been provided for and also because of the tremendous quantities turned out. It was out of the question to start a new factory in any country where there was no protection or a low tariff, as the enterprise would have been drowned out of business immediately.

There is another point which has to be emphasized with regard to the business methods of the Germans. They realized it would help matters to deal direct with customers in their own language, and in their schools young boys were taught French, English, and even Spanish, thus enabling them to correspond with every important country.

Since August, 1914, however, much headway has been made in England, America, and Switzerland, and the manufacturing of anilines has been taken up on a large scale also by Japan, France and Italy. Before the war the industry was more or less at a standstill here, for the very reason that the intermediates needed in the manufacture of the dyes were not produced in America. They had to be imported from England and Germany, thus placing the manufacturers in a position where they could not compete with the German producers except for a few articles, but, since the war, the progress of the chemical business in the United States has been simply wonderful, and I may safely say that for the future this country will not be dependent upon foreign makers. At any rate, one cannot possibly expect to reach within three years the diversity of colors which took the Germans fifty years of constant work to produce.

The manufacture of the so-called intermediates produced from the distillation of coal tar and from which dyestuffs are derived has been started, and if not all the coal tar products, at least the most important ones are being made here, thus enabling the production of various interesting aniline dyes. Some of these intermediates, such as benzine, toluene, xylenes, xylidin, alphanaphtylamine, beta naphtol, etc., are manufactured on a large scale, although some, as, for instance, dianisidine, are only produced in small quantities.

The manufacturers from the beginning wanted to be on the safe side and to help the trade as much as possible. This explains why they started producing the colors which were most in demand and those which could be obtained by using some intermediates, the manufacturing of which had been taken up here especially, in order to meet the demand for high explosives then badly needed by the Allies, whose output at that time was extremely small. As people know, some of these intermediates are used both for explosives and dye manufacturing, and this is what made the German dye manufacturers so helpful; they could at very short notice transform their plants into effective explosive factories.

Since the beginning of hostilities the manufacturers in the United States of America have increased their production daily, and from time to time a new color is added. It is quite true that the fastest colors are not made here yet. Neither are the alizarines and so-called vat colors, which are fast to light and to washing on cotton and silk, but one must bear in mind that "Rome was not built in a day," and as the manufacturers have proven themselves capable of making just as good dyes as Germany, the fast colors will also be produced here. Even now a start has been made to make a few of them. Some of these colors are imported from Switzerland, and the users who absolutely need them can get small quantities.

(*Continued in the next issue*)

National Aniline & Chemical Co., Inc.
244 Madison Avenue **New York**

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OF
ANILINE COLORS
AND
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